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Abstract
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Keywords
real estate, private equity, fund liquidation, institutional capital, economics

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The Wharton School of the University of Pennsylvania

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ABSTRACT

Real estate private equity has become an increasingly favored asset class for institutional investors. This topic is important to academic researchers and industry professionals because it constitutes a large part of the global economy. This research paper will lay out a brief background of the real estate private equity industry and will explore the factors affecting real estate private equity fund performance through the lens of three factors: own effects, rival effects and market effects. The findings and implications from the above analysis will be examined and opined upon. This field is particularly interesting because relatively little research has been done on the real estate private equity landscape, given the limited data that is publically available. The majority of research has been focused on public real estate equities, as it composes a larger portion of the overall economy and is accessible to both professional and retail investors.

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INTRODUCTION

Real estate private equity is a relatively new asset class consisting of debt and equity investments in property. The asset class typically requires active management and has become an increasingly favored choice for institutional investors throughout the globe due to the attractive returns it has offered over the past three decades. This topic is important to academic researchers and industry professionals alike because it constitutes a large part of the global economy and is inextricably linked to many other sectors. This research paper will provide a brief background of the real estate private equity industry. Then, the paper will explore the factors affecting real estate private equity fund performance through the lens of three factors: own effects, rival effects and market effects. Own effects include fund principals' educational backgrounds and size of fund raised, rival effects will include number of funds raised in each year and fund liquidations per year and market effects will include 10-year treasury bills as a proxy for the risk free rate. The findings and implications from the above analysis will be examined and opined upon. This field is particularly interesting because relatively little research has been done on the real estate private equity landscape, given the limited data that is publically available. The majority of research has been focused on public real estate equities, as it composes a larger portion of the overall economy, has more available data and is accessible to both professional and retail investors.

RESEARCH TOPIC

The impact of own, rival and market effects on real estate private equity fund performance.

RELEVANCE OF UNDERSTANDING THE RESEARCH QUESTION

In order to explain the research topic more thoroughly, this paper will define all key or technical terminology. “Own effects” are those that are specific and inherent to a particular fund. Examples of such effects include, but are not limited to, the number of principals within the firm, the educational background of the founding partners, principals’ previous firms and fund size (dollar amount targeted and dollar amount actually raised). “Rival effects” are those that are concerned with funds competing in the same space market, geographical market or asset type. These effects include the number of rival funds with the same vintage year and rival returns in a particular vintage year. It is important to note that a fund’s vintage year is the year in which it first begins to deploy capital. “Market effects” are those that are related to other extrinsic factors that could still have a material impact on fund performance, such as the 10-Year Treasury Note.

This is an important research topic because, according to data from Preqin, in Q2 2015, real estate private equity funds had $253 billion dollars of dry powder, much of which has been committed by pension funds and university endowments throughout the country. Dry powder includes cash reserves or other liquid assets, such as marketable securities, that can be used to purchase, in this instance, real estate assets. It is vital that we better understand the factors that have driven real estate private equity fund performance over the past thirty years, so as to implement strategies for investment throughout the current cycle. Allen, Madura and Springer have explored a similar topic in the context of REITs in their paper “REIT Characteristics and the Sensitivity of REIT Returns.” Through their paper, they explain the sensitivity of REIT returns to the stock market and interest rate changes. The authors then examine whether the structure of their assets, the amount of financial leverage used, the firm’s management strategy,

and the degree of specialization in the portfolio relates to their sensitivity to interest rate changes and market risk. The authors found that whilst a REIT cannot be completely isolated from external forces, minimizing financial leverage and self-managing their portfolio reduces their exposure to these forces.

Given the dearth of comprehensive fund performance data, this paper digs deep into fund website information and other real estate sources such as Preqin and Real Estate Alert. Ultimately, the paper will provide a broad measure of the various funds' (1) portfolios, (2) investment strategy (asset type and target areas), (3) management teams – where they are from, educational background, past jobs, years of experience, (4) projected equity size and (5) target return and (6) actual historical returns. This will provide a broad understanding of the market, with statistically significant conclusions. For this research paper, over 1300 of the largest real estate private equity funds that have been raised over the last thirty years will be targeted. Funds will include those that are opportunistic, value-add, core-plus, high-yield and fund of funds.

This paper will be useful and accessible to real estate scholars, working professionals and policy makers. Although key terms will be defined throughout, the paper is likely to be more useful to those that have a sound foundational understanding of the real estate space and finance. With regards to the working professionals that would find this paper most interesting, it is likely that general private equity investors, as well as those specialized in real estate, would find it useful. In addition, I think it would be more helpful to those working at or forming bourgeoning funds, because through this research, they will be able to identify own, rival and market characteristics that signal whether it is a time to buy, hold or sell. The paper can also provide predictive usefulness with regards to returns. This will allow those that are starting out in the industry to be

aware of some of the pitfalls and keys to success before embarking upon their venture. General private equity investors will also be able to benefit from the findings in this paper should they wish to diversify their investments as many of the mega funds have begun to do in the last decade. The paper will also be useful to institutional investors, those working for pension funds and university endowments, as it will lend key insights into the real estate private equity fund sector that will allow them to hone their strategies. This is vital if they are to successfully manage the retirement accounts of millions of working people throughout the world. Furthermore, academics, particularly those in the finance and real estate field, would be interested in this paper because it is a topic that has yet to be explored and will require analysis of data that is not widely available to the public. Finally, those in policy positions may also find the conclusions that this paper draws interesting because it will improve their knowledge of the sector and aid them in making decisions about regulation, monetary and fiscal policy.

The hypothesis is that all three effects, own, rival and market, will have a measurable impact but that rival effects will have the most dominant impact on real returns for two reasons: (1) by nature of land constrained cities, real estate is an industry that is intimately affected by market supply and demand fundamentals and (2) real estate has proven itself to be an arm of private equity that funds can exploit with relative ease; in this sense, many large private equity firms have developed real estate funds, populated them with knowledgeable industry professionals, and then begun to deploy capital in a reasonably short amount of time. This demonstrates a low barrier to entry into the real estate investing landscape, for many, which could have a disproportionately unfavorable affect on real estate private equity fund returns.

BACKGROUND ON THE INDUSTY

Typically, there are three types of real estate private equity fund: core, opportunistic and value add.

1. *Core funds*: are typically invest in assets that are, high quality (Class A), well leased, conservatively levered (15-30%), characterized by having long hold periods, targeting returns of 8-10% in high barrier-to-entry, primary markets (e.g. New York, Washington D.C., San Francisco, Boston). Core-plus funds are a hybrid that target marginally higher returns, with slightly higher leverage and often a focus on secondary or even tertiary markets. Oftentimes, core and core-plus funds are open-ended, which means that the fund is not limited to constraining the amount of capital raised or timeframe over which it raises capital. Usually, core funds invest in assets with strong, existing cash flow rather than appreciation potential.
2. *Value-add funds*: are typically more highly levered in their investments (50-70%) with expected returns ranging from 14%-17%. The primary returns drivers are both in place cash flow and capital appreciation. Value-add funds often invest in properties that are Class B, under leased or poorly managed but can benefit from rehabilitation and repositioning as a Class A asset or lease up potential. Unlike core funds, value-add funds are often closed-end funds.
3. *Opportunistic funds*: are usually the most levered (70+%), with target returns in excess of 18%. Investments are often in non-core property types or in assets that require extensive redevelopment. The main value driver for opportunistic funds comes from capital appreciation, which makes deals, on average, riskier than those in core or value-add

funds, as the majority of returns are received on the backend of the deal. Similar to value-add funds, most opportunistic funds are closed-end funds.

Real estate private equity funds are usually designed to last ten years from their vintage year.[1] On average, the first three to five years of the life of a fund are spent deploying capital and acquiring real estate. Following this, the fund typically manages the assets and conducts any releasing, management improvements, repositioning or rehabilitations that are necessary before disposing of the assets. This process following the three to five-year investment period typically lasts five to seven years.

The payout structure of the fund is determined by the limited partner agreement or offering memorandum, that is agreed upon by the general partners (those that manage the fund) and limited partners (those that contribute capital to the fund, such as pension funds or university endowments). Typically, GPs receive a management fee (around 2% annually of the total capital commitment) and carried interest, which is a performance fee that is usually around 20% of profits over a hurdle rate. This incentivizes GPs to invest in positive net present value projects and to invest in projects that present an attractive risk-return profile. In addition, it ensures that GPs deploy capital in projects that have the potential to achieve returns superior to the LPs hurdle rate rather than to hoard the capital in order to enjoy the management fees. In addition to this, there are often clauses that stipulate the time by which fund managers must have deployed a certain percentage of the committed capital. This also ensures that the fund managers are actively looking for attractive deals.

[1] Linneman, Peter. *Real Estate Finance & Investments: Risks and Opportunities*. Philadelphia, PA: Linneman Associates, 2004. Print.

RELATED LITERATURE

This paper will draw on three streams of literature to form the conceptual background for this study. The first relevant body of work considers how changes in REIT asset structure, financial leverage, management strategy, and degree of portfolio specialization relates to their sensitivity to interest rate and market risk. Allen, Madura and Springer [2000] find that REITs cannot completely isolate themselves from external economic and market forces. However, they can reduce their exposure and thus influence their degree of market risk by minimizing financial leverage (to reduce sensitivity of their returns to stock-market changes). Furthermore, they can self-manage their investment portfolios. REITs have increasingly tended to favor this structure because it allows them to benefit from the upside of having equity in the operating company. In the medical REIT space, the RIDEA structure has been particularly impactful in allowing REITs, such as Ventas, to move away from the triple net lease structure towards a position in which they have an ownership stake in their operating companies. While the authors concluded that long- and short-term interest rate changes impact REIT returns, they could not conclude that adjustments to the firm's asset structure, use of financial leverage or management strategy could reduce exposure. However, their study examined only 46 publically traded REITs and does not specify if they draw from a variety of asset classes, such as multifamily, office, and medical office. In contrast, this paper will examine the lesser studied, private equity fund market, which is likely to respond in uniquely different ways given the reduced capital markets exposure. Furthermore, their study draws upon data between 1993 and 1997 whereas this paper will be using data from 1980-2015.

The second relevant body of work considers the role of financial leverage in real estate private

equity fund performance. Looking at the periods pre- and post-crisis, Alcock, Baum, Colley and Steiner [2013] conclude that fund performance is almost directly proportional to the return on the underlying real estate market, which would suggest that managers effectively track the performance of their target markets rather than demonstrate investment skill to produce outsized returns. Furthermore, they conclude that leverage cannot be viewed as a sustainable, long-term strategy to increase returns, regardless of the time at which a fund manager increases his leverage. This paper will build upon their research by examining other factors effecting real estate private equity fund performance. In addition, this paper uses a larger data set than the 169 private equity funds used by Alcock et al. Furthermore, although their study considered funds investing in a variety of asset types – diversified, retail, office – they only sampled core, opportunity and value-add funds. This study will examine opportunistic, value-add, core-plus, high yield and fund of funds.

Anson and Hudson-Wilson [2013] take a more qualitative approach to the topic in their paper "Should One Use Leverage in a Private Equity Real Estate Portfolio?" The authors advocate the use of leverage so long as it is conservative and thoughtful and that leverage is positive. Positive leverage occurs when a firm is able to generate returns greater than the rate at which it borrows. In contrast to their study, this paper will be using empirical evidence to explore the topic and will research factors beyond leverage to examine the research topic. The data set used for this paper has leverage metrics for each of the funds, so their effects can be controlled for as a confounding factor when examining the research topic.

The third relevant body of work applies style analysis to real estate private equity in order to examine the probability of obtaining alpha and reducing systematic risk levels. Fuerst and

Marcato [2009] conclude in their paper "Style Analysis in Real Estate Markets: Beyond the Sectors and Regions Dichotomy" that the probability of obtaining alpha performance is dependent upon the funds' exposure to style factors. Style analysis is the measurement and classification of a fund's performance based on its returns. However, the authors' study is focused at the property level and only aggregates on a randomized basis, which does not replicate a well-thought out and constructed portfolio of a private equity fund. Furthermore, the data that this paper draws upon extends beyond the United States and covers funds in Europe, Africa, Asia and Australasia, making it more comprehensive.

DATA COLLECTION

In this paper, over 1300 individual, global private equity real estate funds raised between 1980 and 2015 are analyzed. Fund data has been obtained from Preqin and Real Estate Alert (REA). Preqin is a private research company that provides comprehensive data on real estate private equity fund performance through target and historical IRR data and fund size information. Their real estate database was established in 2006 and is a source of the majority of the empirical data used to run regressions and test the proposed hypotheses. Real Estate Alert is an independent firm that provides real estate research on American, European and Asian institutional real estate markets. The Real Estate Alert database was created in 1989 shortly after Resolution Trust Corporation began its massive liquidation of savings-and-loan assets. REA is one of few sources of information on the private market for real estate funds. Currently, REA contains the terms of all United States property sales in excess of $25 million that have been completed since January 1, 2001. The firm also releases a comprehensive list of global real estate private equity funds

raised each year with information on the size of the target equity raise, size of the actual equity raise, amount of equity deployed, investment target area, target return percentage and asset class.

This paper will draw upon the dataset of 407 individual funds raised in 2015 from REA, which have varied focuses: diversified (73%), retail (4%), office (6%), multi-family (12%), land (1%), hotel (2%) and healthcare (1%). The funds in the REA dataset invest in the United States (63%), Europe (21%), Africa (2%) and Asia (15%). In addition, they comprise of opportunistic (41%), value-add (34%), core-plus (8%), high yield (13%) and fund of funds (4%). To this dataset, I will add over 1300 funds from Preqin, as that data contains actual return information and contains vintages from 1980 to 2012. Within the Preqin data set, the average fund size is $849 million.

Furthermore, this paper will utilize data collected on the parent firms of the funds that are analyzed. Using Private Equity Real Estate's (PERE) ranking of the top 50 real estate private equity funds in the world as a source of information on parent companies, data from websites and articles were aggregated in order to collect information on fund manager education and previous companies, cumulative years of real estate experience, number of staff, investment geographies and whether the firm is public or private. This qualitative data was then codified in order to make it useful for regression analyses. For example, real estate professionals at each of the funds are bucketed depending upon their years of experience in the field.

It is also important to have a thorough understanding of the size of the industry and the current competitive landscape, as that is a key component of the research. As such, using capital raised data, one can deduce that there is a reasonable amount of industry concentration. When analyzing data using concentration ratios, one can see that CR_1 = 20.7%, CR_5 = 40.6%, and CR_{10} = 53.9%. This shows us that, in terms of capital raised, the 10 largest firms account for over 50%

of the industry. Furthermore, the largest firm, The Blackstone Group, accounts for over 20% of the total $234 billion raised.

The main limitation of the data is that although the fund status is declared, closed or liquidated, information about the year of liquidation is not disclosed. Another limitation of the data is that much of the fund information is concentrated by vintage year and target investment geography. Furthermore, many real estate private equity funds keep their information private, especially if they are not publically traded, and this made the analysis more challenging.

DATA CLEANING

With any large dataset, it is important to clean the data in order to ensure the validity and statistical significance of any results. For a number of funds in the dataset, return data or fund size data was erroneous or an outlier. Therefore, using histograms and data plots, the aforementioned data points were removed. Furthermore, many of the investment geographies listed included the names of specific countries within a region. In order to make the analysis of the data more relevant to a wider audience, countries were grouped into five regions: United States, Europe, Asia, Africa and Australasia. In addition to this, fund vintage years in and of themselves are not as useful as the effects of membership in a particular cohort. As such, funds were grouped into cohorts that span a three-year period (the typical length of time a ten-year fund spends acquiring assets). Fund sizes, with regards to the amount of capital raised, were given in local denominated currency and therefore, that data had to be modified to ensure consistency across countries.

DEPENDENT VARIABLE

The dependent variable used in this paper is, internal rate of return (IRR), which is a measure of a fund's actual, realized returns. This measure was used as the left hand side variable in all regression analyses and is a useful dependent variable in that internal rate of return is a universal metric that can be used to compare across funds that invest in geographies throughout the world and invest using currencies other than the United States Dollar. The measure is also useful as it can be readily compared to benchmark index funds if one were to take this research further and explore the extent to which different effects allow real estate private equity funds to outperform or underperform the market.

INDEPENDENT VARIABLES

This paper uses numerous independent variables including:

1. *Fund size (mm)*: the actual amount of capital raised.
2. *Geographical focus*: the region in which the fund primarily invests, which includes United States, Europe, Asia, Africa and Australasia.
3. *Number of rivals*: the number of funds that have the same vintage year and thus began deploying capital for the first time in the same year.
4. *Rival returns by year*: the average returns achieved by a fund throughout its lifetime per vintage year.
5. *Liquidation status*: the status of the fund as "closed" or "liquidated."
6. *Rival cohort*: funds divided into three-year cohorts.

RESULTS/ FINDINGS AND STATISTICAL ANALYSIS

In order to better understand the datasets and the landscape as it currently stands, below is an outline of preliminary findings. These results show that across the risk/return spectrum, from opportunistic to core-plus, the average amount of equity raised as a percentage of target equity is 76%. Broadly, this indicates that investors do not prefer one type of fund to another. There were, however, significant differences between the amount of equity raised and the amount that had been deployed as of March 2015. High yield funds have deployed 67% of the equity raised, whilst opportunistic funds have only deployed 47% of all equity raised in 2015.

It is also important to understand the current allocation of capital with regards to the different sectors of the industry. Of the opportunistic funds that were raised in 2015 and focused on one asset type, the largest amount of capital has been raised to invest in office (33%). Of the $8,025 million that was raised for investment in one asset class, $2,682 million was raised for investment in office. This was followed closely by retail, which comprised 29% of the total raised at $2,315 million.

Below is a statistical analysis that examines the percentage difference between actual equity raised and the targeted amount to determine if the difference is significantly different between core-plus funds and other funds (opportunistic, value add and fund of funds). As is mentioned earlier, core-plus funds fall on one end of the spectrum and are those funds that invest with low leverage in stabilized, low-risk assets, and on the other end, opportunistic funds use high leverage (~70+% loan-to-value) and invest in riskier assets that require significant renovation and often do not have stable cash flows. Before segmenting the landscape by asset type (multifamily, office, industrial, etc.), it is important to understand the differences in how funds

are raised from a strategy level. In comparing core-plus with the other fund types under the assumption that current market conditions are most conducive for the purchasing of core assets, box plots provide a visual representation of the data (see Appendices). It appears that the proportion of core-plus funds that raised all of the equity that they anticipated is higher than the same proportion for the other funds. Performing a Welch's two-sample t-test in R, resulted in the following:

H_0: $\mu_1 = \mu_2$

H_1: $\mu_1 \neq \mu_2$

$t = \frac{\mu_1 - \mu_0}{\frac{s}{\sqrt{n}}} = 0.9574$

p value = 0.343

95% confidence interval (-0.070, 0.198)

Mean of Core Funds: 65%

Mean of Other Funds: 59%

Although empirically the test is not statistically significant when utilizing a 95% confidence interval, there is a noticeable skew towards the positive end. Due to the nature of raw data, which is less clean, one can safely infer that there is a high possibility of a difference. The hypothesis for this difference is that the combination of compressed cap rates in gateway markets and strong inbound flows of foreign capital have inflated prices and thus made opportunistic purchases more difficult. In addition, the amount of distressed real estate in the United States is far lower than in Europe, and the data set is more U.S. centric.

In order to explore the impact of own, rival and market effects on real estate private equity fund performance, multiple regressions were conducted with IRR as the left hand side variable and various factors mentioned above as the right hand side variables.

1. *Own*: in order to test the impact of own effects on real estate private equity fund performance, we regressed actual returns against fund size. The data showed that increasing size reduces fund returns in a statistically significant manner ($p<0.0123$). Indeed, an increase in fund size of $100 million reduces fund returns, on average, by 0.1%. The negative relationship between fund size and fund performance can be explained in several ways. One explanation for the fact that real estate private equity funds, like venture capital funds, do not benefit from scale could be that increased capital commitments force fund managers to "push money out the door" in order to fulfill their obligations to LPs and thus are less selective about their investment criteria. This result may have changed if we controlled for a variable such as fund type (core, value-add, opportunistic). However, this information was not available for all funds in the dataset.
2. *Rival*:
    a. *Rival returns*: controlling for the geographical region in which the fund invests, the size of the fund (mm) and the number of rivals, rival returns each year are a significant predictor ($p<0.001$) of actual returns. Indeed, a 1% increase in rival returns in a particular year, increases fund returns by over 1% on average. This could potentially be explained by a correlation with market forces that have positive, or negative effects on all funds within a particular vintage rather than a direct and independent linkage between rivals performing better and increasing returns.
    b. *Number of rivals*: increasing the number of rivals has a statistically significant effect in reducing actual fund returns. Indeed, the data yielded that 100 extra rival funds reduces returns on average by 1.5%. This effect is as expected and confirms

the hypothesis that there are supply side effects at work in the real estate private equity landscape. Ceteris paribus, the more capital there is chasing a fixed number of assets, the more returns are likely to be negatively impacted. In addition, any excess returns that are available will be competed away as additional funds enter the market.

3. *Market:*

   a. *10-Year Treasury Bills*: controlling for fund size (mm), and number of rivals, a 1% increase in the 10-Year Treasury Bill rate during the fund's investment period yielded a 3.88% reduction in actual returns. The independent variable, 10-Year Treasury Bill, is measured using a five-year average during the first five years of the funds existence. This is supposed to act as an approximate proxy for the cost of money the fund would have had to utilize as they began deploying capital. This result may have been more significant or informative if we had controlled for fund type, as the amount of leverage used varies between core, value-add and opportunistic funds. In addition, different investment geographies attract various levels of leverage that are affected by cultural norms regarding an appropriate debt burden or local financial institutions not lending beyond a particular threshold.

   b. *Cohorts*: cohort membership has a statistically significant effect on fund performance. Cohorts, measured in three-year increments, decreased actual returns by 6.22% ($p<0.0404$) between 2003-2007 and increased returns by 4.69% if one was a member of the 1992-1995 cohort.

FUTURE WORK

This paper has gone through several iterations, and a particularly important development was in obtaining actual return data in order to broaden the definition of "performance." This data was obtained from Preqin and facilitated the evaluation of fund performance in a more useful way than capital raised. Large, established firms with a strong track record are usually able to raise more from pension funds and university endowments that do not want to take as much risk. However, as the evidence above suggests, it appears that smaller, bourgeoning funds, that perhaps missed their equity raise target, have innovative strategies that are distinguishing them with high returns on average.

Another important part of this research involves controlling for confounding factors. Although the dataset used in this paper is reasonably comprehensive and contains over 1300 funds with actual return data, liquidation data, investment geographies and asset types, it would be useful to incorporate the use of leverage, investment experience, educational background and parenting effects to see if they influence the outcomes. To take parenting effects as an example, it could be the case that if the fund manager of a smaller fund has a track record at a larger, more established fund, he or she is less at risk of diminished access to capital from institutional investors than someone that founded a fund without such connections and pedigree. In addition that fund manager may have tacit knowledge from their past work experience that they are able to exploit in order to improve the returns of their own fund.

Furthermore, in the future, it would be interesting to expand the dataset beyond the United States. Although the data set that used contains fund data from across the world, it is more heavily focused on the United States. It would be very interesting to see if the patterns that have

been observed above in the United States are mirrored in Europe and Asia. The investment landscapes in those regions are vastly different, therefore it would require one to control for more variables, but it would lend great insight into the industry, particularly given the increasing global nature of many firm's investment strategies.

The original focus of this research paper was on the effects of specialized fund liquidation on the competitive landscape and the performance of competitor funds. "Specialized funds" are those focused on a particular sector while the "competitive landscape," is concerned with the success of subsequent capital fundraising. It is possible that some of the subsequent funds raised struggled to find capital because liquidations suggest a weakening market or, on the contrary, they may have found it easier because institutional investors, such as pension funds, have fewer places to allocate their money. Finally, in exploring the "performance of competitor funds," the paper proposed to look at the real return data from funds that have operated in the aforementioned landscape to see if their performance increased, decreased or flat lined after the liquidation of their competitors.

The first hypothesis for this future research is that the premature liquidation of specialized real estate private equity funds will (1) lead to difficulty in raising funds for investment in that sector in the following years and (2) have a positive effect on competitor fund returns. The second hypothesis is that the liquidation of specialized real estate private equity funds will weaken the competitive landscape and reduce the remaining funds' competition for assets in their target markets and thus allow them to generate more favorable returns. Unfortunately, this could not be tested given a lack of data on fund liquidation year. With a more expansive and comprehensive dataset, which is being developed by a number of firms, this would be a thoroughly interesting

and informative research topic to explore in the future.

In the future, gathering more qualitative data, such as interviews of experts in the industry would lend an interesting perspective to the topic. Talking to a broad range of people who have a deep knowledge of the industry and can comment on the business from various perspectives would lend this research more legitimacy. As part of this research paper, there is a compiled list of prominent investors in the space that are affiliated with the Zell-Lurie Centre at Wharton and could be contacted for a brief survey and phone call. Taking an open approach so as not to limit the scope and direction of the conversation would yield the most useful results. However, Institutional Review Board (IRB) approval would likely be needed because of the focus on conducting human research and using the interview data gathered to contribute to generalizable knowledge.

CONCLUSION

This paper provides an overview of the determinants of real estate private equity fund performance; specifically, the paper analyzes how (1) own, (2) rival and (3) market effects impact real returns. From the results, one can deduce that market effects have the largest impact on returns. In particular, cohort membership and the rate at which firms can borrow seem to be most dominant in predicting and affecting the success of the fund. Although the results do not support the original hypothesis that rival effects would dominate, this paper has demonstrated that extrinsic factors have a greater impact than the supply side effects of rival funds or intrinsic factors. Interestingly, just as Allen, Madura and Springer [2000] found that publically traded real

estate investment trusts could not entirely isolate themselves from external economic and market forces, so too one can see that relationship even in the world of real estate private equity. This is surprising in that real estate private equity is less linked to the public markets. However, the underlying value of a pure play REIT is its real estate. The same is true for a real estate private equity fund and thus both are intimately linked to and affected by movements in market forces. These results demonstrate the difficultly with which institutional investors must have to allocate their capital to real estate private equity funds in that the most important factors determining performance are not controllable. In addition, policy makers must carefully consider the ramifications of their actions in light of the inextricable link between real estate private equity returns, which are driven by real estate values, and the country's monetary policy.

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APPENDICES

Table 1.

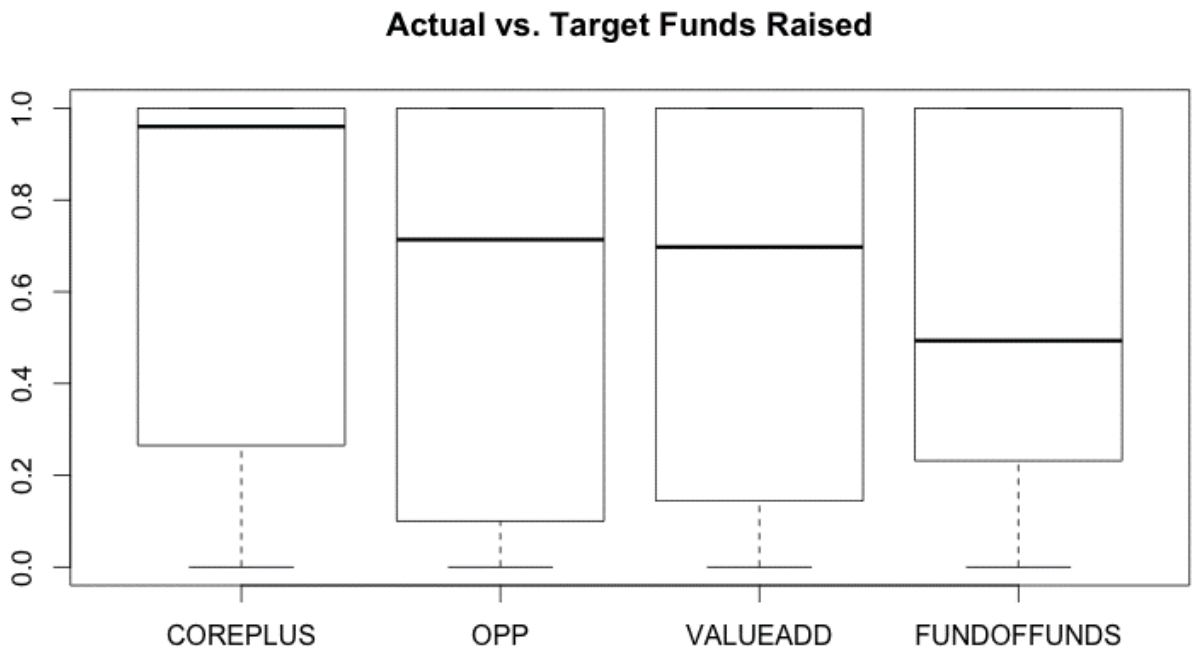


Table 2.

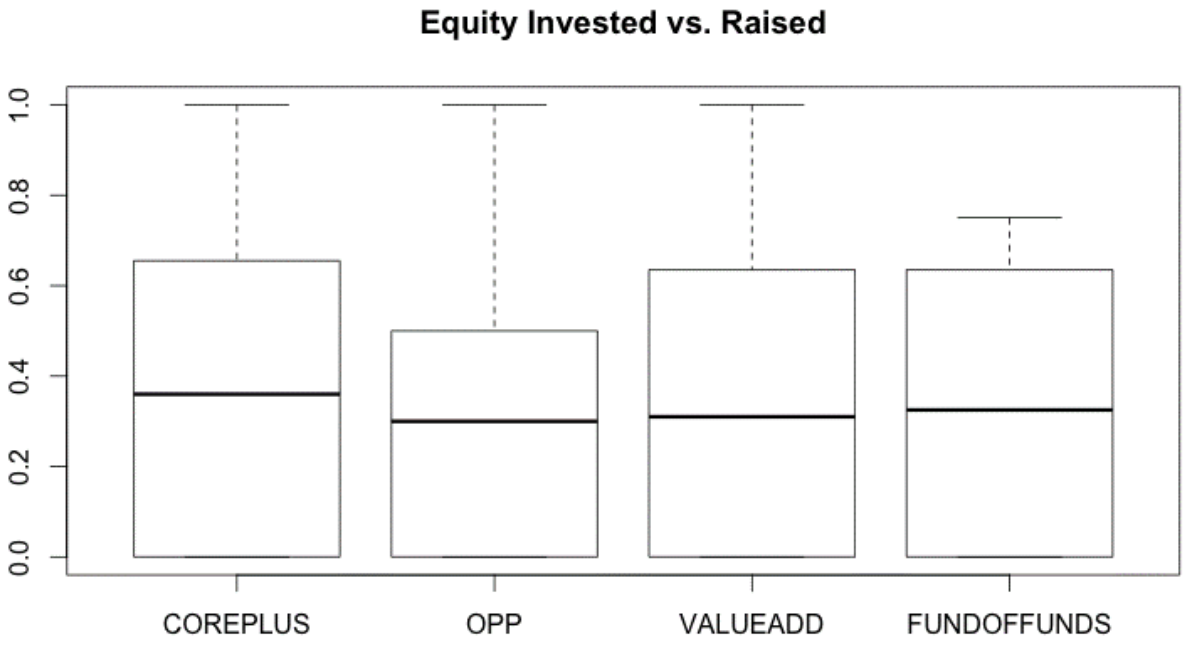
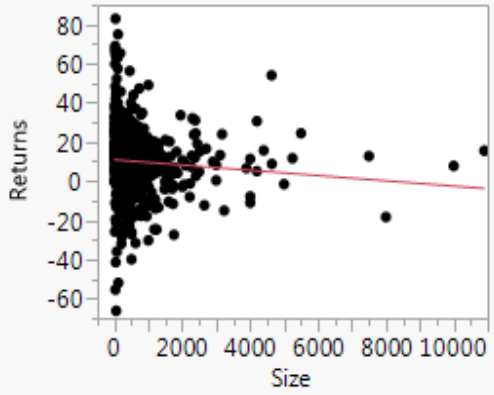

Equity Invested vs. Raised
0.0
0.2
0.4
0.6
0.8
1.0
COREPLUS
OPP
VALUEADD
FUNDOFFUNDS

Table 3.

Response Returns

Effect Summary

Regression Plot



Summary of Fit

RSquare	0.006468
RSquare Adj	0.005441
Root Mean Square Error	14.54305
Mean of Response	10.2516
Observations (or Sum Wgts)	969

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	1331.48	1331.48	6.2954
Error	967	204520.72	211.50	Prob > F
C. Total	968	205852.20		0.0123*

Lack Of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack Of Fit	533	108854.40	204.230	0.9265
Pure Error	434	95666.32	220.429	Prob > F
Total Error	967	204520.72		0.7991
				Max RSq
				0.5353

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	10.956006	0.545054	20.10	<.0001*
Size	-0.001344	0.000536	-2.51	0.0123*

Effect Tests

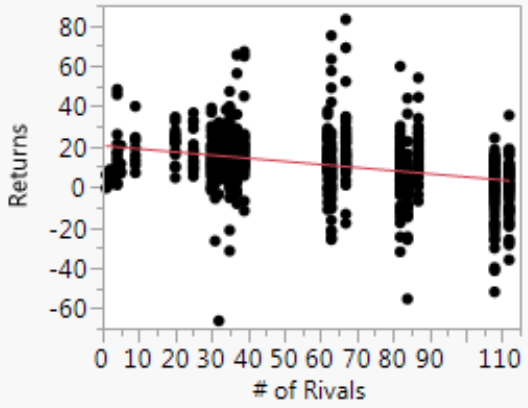
Effect Details

Table 4.

Response Returns

Effect Summary

Regression Plot



Summary of Fit

RSquare	0.115844
RSquare Adj	0.114969
Root Mean Square Error	13.56529
Mean of Response	10.1335
Observations (or Sum Wgts)	1012

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	1	24351.53	24351.5	132.3329
Error	1010	18585.40	184.0	Prob > F
C. Total	1011	21020.893		<.0001*

Lack Of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack Of Fit	20	2614.385	1307.19	8.1028
Pure Error	990	15971.355	161.33	Prob > F
Total Error	1010	18585.740		<.0001*
				Max RSq
				0.2402

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	20.433393	0.99172	20.60	<.0001*
# of Rivals	-0.154141	0.013399	-11.50	<.0001*

Effect Tests

Effect Details

Table 5.

Response Returns

Effect Summary

Source	LogWorth	PValue
# of Rivals	49.280	0.00000
T-Bill (10YR)	18.477	0.00000
Size	0.083	0.82534

Remove Add Edit FDR

Summary of Fit

RSquare	0.204942
RSquare Adj	0.202483
Root Mean Square Error	13.01819
Mean of Response	10.246
Observations (or Sum Wgts)	974

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	42374.47	14124.8	83.3455
Error	970	164389.05	169.5	Prob > F
C. Total	973	206763.52		<.0001*

Lack Of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack Of Fit	898	15019048	167.250	0.8481
Pure Error	72	14198.57	197.202	Prob > F
Total Error	970	164389.05		0.8466
				Max RSq
				0.9313

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob>|t|
Intercept	42.251679	2.420278	17.46	<.0001*
T-Bill (10YR)	-3.887205	0.424926	-9.15	<.0001*
Size	1.701e-5	0.000077	0.22	0.8253
# of Rivals	-0.252705	0.016032	-15.76	<.0001*

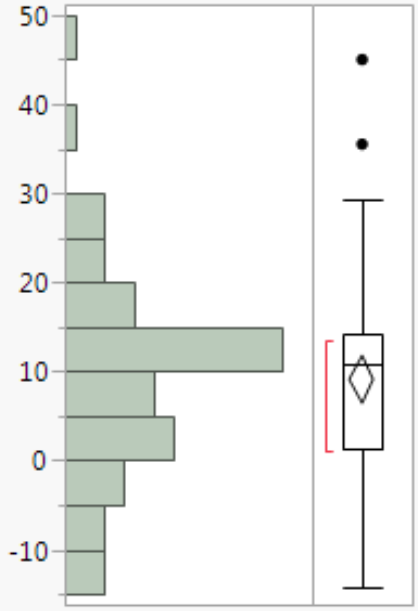
Effect Tests

Effect Details

Table 6.

Distributions Location = Asia

Returns



Quantiles

100.0%	maximum	45
99.5%		45
97.5%		36.925
90.0%		23.64
75.0%	quartile	14.2
50.0%	median	10.7
25.0%	quartile	1.3
10.0%		-7.28
2.5%		-14.045
0.5%		-14.3
0.0%	minimum	-14.3

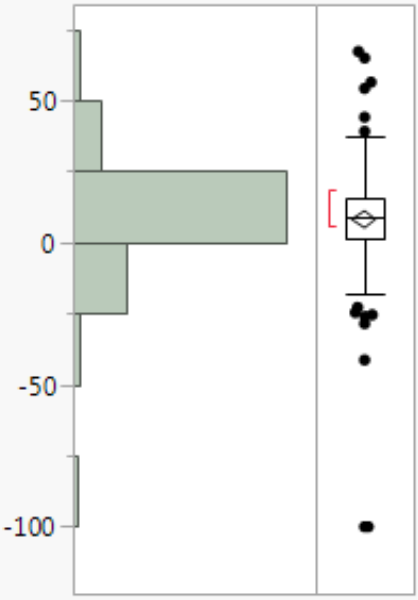
Summary Statistics

Mean	9.0342466
Std Dev	11.584775
Std Err Mean	1.3558953
Upper 95% Mean	11.737175
Lower 95% Mean	6.3313186
N	73

Table 7.

Distributions Location = Europe

Returns



Quantiles

100.0%	maximum	67.1
99.5%		67.1
97.5%		51.07
90.0%		26.48
75.0%	quartile	15.6
50.0%	median	8.7
25.0%	quartile	1.3
10.0%		-11.44
2.5%		-27.85
0.5%		-100
0.0%	minimum	-100

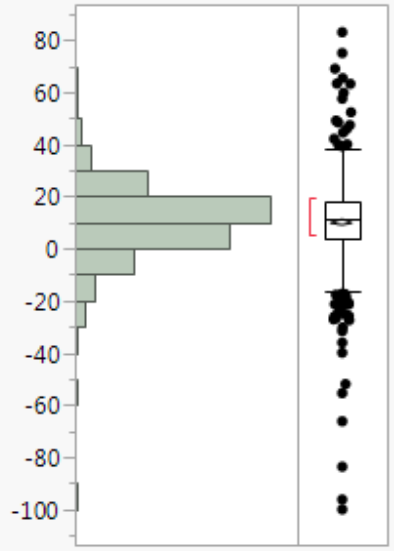
Summary Statistics

Mean	8.1888889
Std Dev	19.308064
Std Err Mean	1.4765246
Upper 95% Mean	11.103573
Lower 95% Mean	5.2742047
N	171

Table 8.

Distributions Location=US

Returns



Quantiles

100.0%	maximum	83
99.5%		66.03
97.5%		38.2375
90.0%		25.1
75.0%	quartile	17.7
50.0%	median	11
25.0%	quartile	3.8
10.0%		-5.3
2.5%		-25.0375
0.5%		-69.245
0.0%	minimum	-100

Summary Statistics

Mean	10.161649
Std Dev	15.751119
Std Err Mean	0.5698555
Upper 95% Mean	11.28032
Lower 95% Mean	9.0429785
N	764